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ABSTRACT

This flight test guide assists the applicant and his instructor in preparing for the Commercial Pilot Certificate with Airplane Rating under Part 61 (revised) of Federal Aviation Regulations. It contains information concerning pilot operations, procedures, and maneuvers relevant to the flight test required for the certificate. Preflight duties, flight at critically slow airspeeds, takeoffs and landings, maximum performance maneuvers, operation of airplane equipment, and emergency procedures are outlined. A suggested flight test checklist is included. (KP)

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AC 61-55

FLIGHT TEST GUIDE

(Part 61 Revised)

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COMMERCIAL PILOT

Airplane...

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DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA

1973

CE 000 485

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

ED 083460

AC 61-55

FLIGHT TEST GUIDE

[Part 61 Revised]

COMMERCIAL PILOT

Airplane

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Flight Standards Service

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PREFACE

Part 61 (revised) of Federal Aviation Regulations, effective 1 November 1973, establishes a new concept of pilot training and certification requirements. To provide a transition to these revised requirements, Part 61 (revised) permits the applicant, for a period of 1 year after the effective date, to meet either the previous requirements or those contained in the revised part. AC 61–117–1D, the Commercial Pilot Flight Test Guide, dated 1972, outlines the previous requirements.

This flight test guide, AC 61–55, has been prepared by Flight Standards Service of the Federal Aviation Administration to assist the applicant and his instructor in preparing for the flight test for the Commercial Pilot Certificate with Airplane Rating under Part 61 (revised). It contains information and guidance concerning the pilot operations, procedures, and maneuvers relevant to the flight test required for that certificate. A suggested flight test checklist is included for the convenience of those who may find such a checklist useful.

In addition to providing help to the applicant and his instructor, this guide will be

useful to FAA Inspectors and designated pilot examiners in the conduct and standardization of flight tests. Persons using this guide in connection with commercial pilot training and flight tests should also refer to the applicable *Federal Aviation Regulations; Airman's Information Manual; Flight Training Handbook, AC 61–21;* and other pertinent advisory circulars.

Comments regarding this guide may be directed to Department of Transportation, Federal Aviation Administration, Flight Standards Technical Division, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

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APPLICANT'S FLIGHT TEST CHECKLIST

(Suggested)

APPOINTMENT WITH INSPECTOR

or EXAMINER: Name _____

Time/Date _____

ACCEPTABLE AIRPLANE

- ☐ View-limiting device
- ☐ Aircraft Documents:
  - Airworthiness Certificate
  - Registration Certificate
  - Operating Limitations
  - Weight and Balance Data
- ☐ Aircraft Maintenance Records:
  - Airworthiness Inspections
- ☐ FCC Station License

PERSONAL EQUIPMENT

- ☐ Current Aeronautical Charts
- ☐ Computer and Plotter
- ☐ Flight Plan Form
- ☐ Flight Logs
- ☐ Current AIM

PERSONAL RECORDS

- ☐ Pilot Certificate
- ☐ Medical Certificate
- ☐ Signed Recommendation (if applicaable)
- ☐ Written Test Results
- ☐ Logbook
- ☐ Notice of Disapproval (if applicable)
- ☐ Approved School Graduation Certificate (if applicable)
- ☐ FCC Radiotelephone Operator Permit
- ☐ Examiner's Fee (if applicable)

GENERAL INFORMATION

PILOT TRAINING AND CERTIFICATION CONCEPT

Part 61 of the Federal Aviation Regulations has been revised and upgraded to reflect the complexity of the modern aircraft as well as its operating environment. In the past, airman certification requirements could be met by training a student to pass a written test and then to demonstrate his ability to perform predetermined flight training maneuvers during a flight test. Rather than merely duplicating on the flight test the maneuvers used for training, the new training and certification concept requires that the applicant receive instruction in and demonstrate his competency in *all pilot operations* listed in pertinent sections of Part 61 (revised). A pilot operation, as used herein, is a group of related procedures and maneuvers involving skills and knowledge required to safely and efficiently function as a pilot. The specific procedures and maneuvers used to teach the pilot operations are not listed in Part 61 (revised). Instead, the instructor is permitted to select procedures and maneuvers from FAA approved training publications pertinent to the certificate or rating sought.

The instructor indicates by logbook endorsement that the applicant has demonstrated competency in all the required pilot operations and considers him qualified to pass the flight test. On the flight test, the examiner[1] selects the procedures and maneuvers to be performed by the applicant to show competency in each required pilot operation.

The procedures and maneuvers appropriate to the Commercial Pilot Certificate with an airplane rating are contained in AC 61-21, *Flight Training Handbook.*

USE OF THIS GUIDE

The pilot operations listed in this flight test guide, indicated by Roman numerals, are required by Section 61.127 of Part 61 (revised). This guide is intended only to outline appropriate pilot operations and the minimum standards for the performance of each procedure or maneuver which will be accepted by the examiner as evidence of the pilot's competency. It is not intended that the applicant be tested on every procedure or maneuver within each pilot operation, but only those considered necessary by the examiner to determine competency in each pilot operation.

---

[1] The word "examiner" is used hereafter in this guide to denote either the Federal Aviation Administration Inspector or designated pilot examiner who conducts an official flight test.

When, in the judgment of the examiner, certain demonstrations are impractical (for example, equipment malfunctions), competency may be determined by oral testing.

This guide contains an ***Objective*** for each required pilot operation. Under each pilot operation, pertinent procedures or maneuvers are listed with ***Descriptions*** and ***Acceptable Performance Guidelines.***

1. The ***Objective*** states briefly the purpose of each pilot operation required on the flight test.

2. The ***Description*** provides information on what may be asked of the applicant regarding the selected procedure or maneuver. The procedures or maneuvers listed have been found most effective in demonstrating the objective of that particular pilot operation.

3. The ***Acceptable Performance Guidelines*** include the factors which will be taken into account by the examiner in deciding whether the applicant has met the objective of the pilot operation. The airspeed, altitude, and heading tolerances given represent the minimum performance expected in good flying conditions. However, consistently exceeding these tolerances before corrective action is initiated is indicative of an unsatisfactory performance. Any procedure or action, or the lack thereof, which re-

quires the intervention of the examiner to maintain safe flight will be disqualifying. Failure to exercise proper vigilance or to take positive action to ensure that the flight area has been adequately cleared for conflicting traffic will also be disqualifying.

Emphasis will be placed on procedures, knowledge, and maneuvers which are most critical to a safe performance as a pilot. The demonstration of prompt stall recognition, adequate control, and recovery techniques will receive special attention. Other areas of importance include spatial disorientation, collision avoidance, and wake turbulence hazards.

The applicant will be expected to know the meaning and significance of the airplane performance speeds important to the pilot, and be able to readily find those speeds for the airplane used for the flight test. These speeds include:

V_{so} – the stalling speed or minimum steady flight speed in landing configuration.

V_y – the speed for the best rate of climb.

V_x – the speed for the best angle of climb.

V_a – the design maneuvering speed.

V_{ne} – the never exceed speed.

V_{le} – the maximum landing gear extended speed.

V_{fe} – the maximum flap extended speed.

In the event the applicant takes the instrument pilot flight test and the commercial pilot flight test simultaneously, the maneuvers selected by the examiner may be combined and evaluated together, where practicable.

In the event the commercial pilot flight test is taken in a multiengine airplane, the Description and Acceptable Performance Guidelines found in Section 1 of AC 61–57, Multiengine Airplane Class and Type Rating Flight Test Guide, *will be used for each required maneuver which is performed differently in multiengine airplanes,* rather than those in this guide.

GENERAL PROCEDURES FOR FLIGHT TESTS

The ability of an applicant for a commercial pilot certificate, or for an aircraft or instrument rating on that certificate, to perform the required pilot operations is based on the following:

1. Executing procedures and maneuvers within the aircraft's performance capabilities and limitations, including use of the aircraft's systems.
2. Executing emergency procedures and maneuvers appropriate to the aircraft.
3. Piloting the aircraft with smoothness and accuracy.
4. Exercising judgment.
5. Applying his aeronautical knowledge.

6. Showing that he is the master of the aircraft, with the successful outcome of a procedure or maneuver never seriously in doubt.

If the applicant fails any of the required pilot operations, he fails the flight test. The examiner or the applicant may discontinue the test at any time when the failure of a required pilot operation makes the applicant ineligible for the certificate or rating sought. If the test is discontinued the applicant is entitled to credit for only those entire pilot operations that he has successfully performed.

FLIGHT TEST PREREQUISITES

An applicant for the commercial pilot flight test is required by the revised Part 61 to have: (1) a private pilot certificate with an airplane rating or meet the flight experience required for a private pilot certificate (airplane rating) and pass the applicable (Part 61, Subpart D) written and practical test; (2) an instrument rating (airplane) or a limitation will be placed on his commercial certificate prohibiting the carriage of passengers for hire on cross-country flights of more than 50 nautical miles or at night; (3) passed the appropriate commercial pilot written test within 24 months before the date he takes the flight test; (4) the applicable instruction and aeronautical experience prescribed for a commercial pilot certificate; (5) a first or second class medical certificate issued within

the past 12 months; (6) reached at least 18 years of age; and (7) a written statement from an appropriately certificated flight instructor certifying that he has given the applicant flight instruction in preparation for the flight test within 60 days preceding the date of application, and finds him competent to pass the test and to have a satisfactory knowledge of the subject areas in which he is shown to be deficient by his airman written test report.

AIRPLANE AND EQUIPMENT REQUIREMENTS FOR FLIGHT TEST

The applicant is required by revised Section 61.45 to provide an airworthy airplane for the flight test. This airplane must be capable of, and its operating limitations must not prohibit, the pilot operations required on the test. The following equipment is relevant to the pilot operations required by revised Section 61.127 for the commercial pilot flight test:

1. Two-way radio suitable for voice communications with aeronautical ground stations.
2. A radio receiver which can be utilized for available radio navigation facilities (may be the same radio used for communications).
3. If the applicant does not hold an instrument rating and takes the instrument pilot flight test simultaneously with the

commercial flight test, the airplane used must have appropriate flight instruments for the control of the airplane during instrument conditions. Appropriate flight instruments are considered to be those outlined in FAR Part 91 for flight under instrument flight rules. However, if the applicant does not desire the instrument privileges associated with the commercial pilot certificate, he is not required to provide for the flight test an airplane equipped for flight under instrument flight rules.

4. Engine and flight controls that are easily reached and operated in a normal manner by both pilots, unless the examiner determines the flight test can be conducted safely without them. Fully functioning dual controls are required by Part 91 for simulated instrument flight.

5. A suitable view-limiting device, easy to install and remove in flight, for simulating instrument flight conditions.

6. Operating instructions and limitations. The applicant should have an appropriate checklist, an Owner's Manual/Handbook, or if required for the airplane used, an FAA approved Airplane Flight Manual. Any operating limitations or published recommendations of the manufacturer that are applicable to the specific airplane shall be observed.

7. An airplane equipped with retractable landing gear, flaps, and controllable propeller(s), if a landplane rating is sought.

8. An amphibian or floatplane equipped with flaps and controllable propeller(s), if a seaplane rating is sought.

PILOT OPERATIONS
Procedures/Maneuvers

I. PREFLIGHT DUTIES

Objective

To determine that the applicant can ensure that he meets the requirements to act as pilot in command, that the airplane is airworthy and ready for safe flight, and that suitable weather conditions exist.

Procedures/Maneuvers

A. Certificates and Documents

1. *Description* The applicant may be asked to present his pilot and medical certificates and to locate and explain the airplane's registration certificate, airworthiness certificate, operating limitations or FAA-approved Airplane Flight Manual (if required), equipment list, and required weight and balance data. In addition, he is expected to explain the airplane and engine logbooks or other maintenance records.

2. *Acceptable Performance Guidelines* The applicant shall be knowledgeable regarding the location, purpose, and significance of each required item.

B. Airplane Performance and Limitations

1. Description The applicant may be orally quizzed on the performance capabilities and approved operating procedures and limitations of the airplane used. This includes power settings, placarded speeds, and fuel and oil requirements. In addition, the manufacturer's published recommendations or FAA-approved Airplane Flight Manual should be used to determine the effects of temperature, pressure altitude, wind, and gross weight on performance.

2. Acceptable Performance Guidelines The applicant shall obtain, explain, and apply the information which is essential in determining the performance of the airplane used.

C. Weight and Balance

1. Description The applicant may be asked to demonstrate the application of the approved weight and balance data for the airplane used to determine that the gross weight and c.g. (center of gravity) location are within limits. Charts and graphs provided by the manufacturer may be used.

2. Acceptable Performance Guidelines The applicant shall determine the empty weight, maximum gross weight, useful load (fuel, passengers, baggage) by reference to appropriate publications, and shall apply that information to determine that the gross

weight and c.g. are within approved limitations.

D. Weather Information

1. Description The applicant may be asked to obtain Aviation Weather Reports, Area and Terminal Forecasts, and Winds Aloft Forecasts pertinent to the proposed flight.

2. Acceptable Performance Guidelines The applicant shall demonstrate that he knows what weather information is pertinent and how to best obtain that information, and that he can interpret and understand its significance with respect to his proposed flight.

E. Line Inspection

1. Description The applicant may be asked to demonstrate a visual check to determine the airplane's airworthiness and readiness for flight. This includes all required equipment and documents. A checklist provided by the manufacturer or operator should be used.

2. Acceptable Performance Guidelines The applicant shall use an orderly procedure in conducting a preflight check of the airplane. He shall know the significance of each item checked and recognize any unsafe condition.

F. Airplane Servicing

1. Description The applicant may be asked to demonstrate a visual inspection to determine that the fuel is of the proper grade and type and that the fuel and oil supply is adequate for the proposed flight. He should take appropriate action to eliminate possible fuel contamination in the airplane. In addition, he should know how to check the adequacy of the oxygen supply on airplanes so equipped.

2. Acceptable Performance Guidelines The applicant shall know the grade and type of oil and fuel specified for the airplane and be able to determine the amount of oxygen and fuel required to complete the flight. He shall know the proper steps for avoiding fuel contamination during and following servicing.

G. Engine and Systems Preflight Check

1. Description The applicant may be asked to demonstrate a check to determine that the engine is operating within acceptable limits and that all systems, equipment, and controls are functioning properly and adjusted for takeoff. A checklist provided by the manufacturer or operator should be used.

2. Acceptable Performance Guidelines The applicant shall use proper procedures in engine starting and runup and in checking airplane systems, equipment, and controls to determine that the airplane is

ready for flight. Careless operation in close proximity to obstructions, ground personnel, or other aircraft shall be disqualifying.

II. FLIGHT AT CRITICALLY SLOW AIRSPEEDS

Objective

To determine that the applicant can competently maneuver the airplane at critically slow airspeeds in various attitudes and configurations, and that he can recognize imminent stalls and can accomplish prompt, effective recoveries in all normally anticipated flight situations.

Procedures/Maneuvers

A. Maneuvering at Minimum Controllable Airspeeds

1. Description The applicant may be asked to maneuver at such an airspeed that controllability is minimized to the point that if the angle of attack or load factor is further increased, an immediate stall would result. The maneuver should be accomplished in medium-banked level, climbing and descending turns, and straight-and-level flight with various flap settings in both cruising and landing configurations.

2. Acceptable Performance Guidelines The applicant shall be evaluated on his competence in establishing the minimum controllable airspeed, in positively controlling the airplane, and in recognizing incipient

stalls. Primary emphasis shall be placed on airspeed control. During straight-and-level flight at this speed, the applicant shall maintain altitude within ±50 ft. and heading within ±10° of that assigned by the examiner. Inadequate surveillance of the area prior to and during the maneuver, or an unintentional stall shall be disqualifying.

B. Imminent Stalls

1. Description The applicant may be asked to demonstrate recoveries from imminent stalls entered from straight flight and from turning flight with power on and with power off. He is expected to place the airplane in the attitude and configuration appropriate for flight situations such as takeoffs, departures, landing approaches, and accelerated maneuvers, as directed by the examiner. The applicant should apply control pressures which result in an increase in angle of attack until the first buffeting or decay of control effectiveness is noted. The recovery should be accomplished immediately by reducing the angle of attack. Recoveries should be made with or without power, as directed by the examiner.

2. Acceptable Performance Guidelines The applicant shall be evaluated on his competence in recognizing the indications of an imminent stall and in taking prompt, positive control action to prevent a full stall. The applicant shall be disqualified if a full

stall occurs or if it becomes necessary for the examiner to take control of the airplane to avoid excessive airspeed, excessive loss of altitude, or a spin.

III. TAKEOFFS AND LANDINGS

Objective

To determine that the applicant is competent in performing takeoffs and landings under all normally anticipated conditions in a landplane equipped with retractable landing gear, flaps, and controllable propeller(s), or in a seaplane with flaps and controllable propeller.

Procedures/Maneuvers

A. Normal and Crosswind Takeoffs (Landplanes)

1. Description The applicant may be asked to demonstrate normal and crosswind takeoffs by aligning the airplane with the runway or takeoff surface and applying takeoff power smoothly and positively while maintaining directional control. In crosswind takeoffs he is expected to hold aileron into the wind and maintain a straight takeoff path by use of rudder and to gradually establish a pitch attitude which produces an angle of attack that permits normal acceleration and liftoff.

The applicant may be asked to make at least one crosswind takeoff with sufficient crosswind to require the use of crosswind

techniques, but not in excess of the crosswind limitations of the airplane used.

2. Acceptable Performance Guidelines The applicant's competence in performing normal and crosswind takeoffs shall be evaluated on the basis of power application, smoothness, wind drift corrections, coordination, and directional control. The applicant shall maintain climb speed within ±5 knots of the desired initial climb speed after liftoff. Improper or incomplete after-takeoff procedures shall be disqualifying.

B. Normal and Crosswind Landings (Landplanes)

1. Description The applicant may be asked to accomplish normal and crosswind landings using a final approach speed equal to 1.3 times the power-off stalling speed in landing configuration (1.3 V_{so}), or the final approach speed prescribed by the manufacturer. The landings may be accomplished with or without power, with touchdowns being made within the area specified by the examiner. Landings may be made with full flaps, partial flaps, or no flaps. Forward slips and a slip to a landing may be performed with or without flaps, unless prohibited by the airplane's operating limitations.

In a tailwheel type airplane, the main wheels and tailwheel should touch the runway simultaneously at or near power-off stalling

speed. In a nosewheel type airplane, the touchdown should be on the main wheels with little or no weight on the nosewheel. In strong gusty surface winds, in a tailwheel type airplane, the round-out should be made to an attitude which permits touchdown on the main wheels only. In crosswind conditions, wind drift corrections should be made throughout the final approach and touchdown. Adequate corrections and positive directional control should be maintained during the after-landing roll.

The applicant may be asked to make at least one crosswind landing with sufficient crosswind to require the use of crosswind techniques but not to exceed the crosswind limitations of the airplane. The applicant may be asked to demonstrate at least one power-off accuracy landing.

2. *Acceptable Performance Guidelines* The applicant's competence in performing normal and crosswind landings shall be evaluated on the basis of his landing technique, judgment, wind drift correction, coordination, power technique, and smoothness. He shall maintain the proper final approach speed within ± 5 knots, and touchdown in the proper landing attitude beyond and within 200 ft. of a line or mark specified by the examiner.

Improper or incomplete pre-landing procedures, touching down with an excessive side

load on the landing gear, and poor directional control shall be disqualifying.

C. Seaplane Taxiing

1. Description The applicant may be asked to demonstrate taxiing at slow speeds and on the step, into the wind, downwind, and crosswind. Turns to downwind headings, step turns, sailing, docking, and simulated or actual approaches to a buoy should be included. The applicant should demonstrate taxiing with and without the use of a water rudder, if the seaplane is so equipped.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his proper use of flight controls, power, and water rudder to safely and effectively maneuver the seaplane. Any faulty technique which results in a hazardous situation shall be disqualifying.

D. Seaplane Takeoffs

1. Description The applicant may be requested to demonstrate takeoffs into the wind, and with light crosswind components. He may also be asked to demonstrate, when feasible, or to describe in detail any or all of the following:

a. High-density altitude takeoffs from glassy water;

b. Takeoffs from choppy water or ocean swells; and

c. Takeoffs from streams or inlets with significant current or tide and downstream wind.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his smooth operation of the power and flight controls, directional control, and ability to achieve an efficient planing attitude promptly and to make a smooth, effective transition to flight. Misuse of the controls, consistent retarding of takeoffs by premature rotation for liftoff, or failure to take immediate corrective action to stop porpoising while on the step shall be disqualifying.

E. Seaplane Landings

1. Description The applicant may be asked to demonstrate landings into the wind, and with light crosswind components. Landing approaches should be made in accordance with the established traffic pattern for the area used, and with a final approach speed of approximately 1.3 times the power-off stalling speed in landing configuration (1.3 V_{so}), or the final approach speed recommended by the aircraft manufacturer. A straight course should be maintained during touchdown and throughout the runout on the surface. The applicant may also be asked to demonstrate, if feasible, or to describe in detail any of the following:

a. Landings on glassy water;

b. Landings on choppy water or ocean swells; and

c. Emergency landings on airports or unprepared fields.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of the accuracy of his approaches, wind drift corrections, correct use of the controls in flight and on the surface, and on his landing technique. He shall maintain the desired final approach speed within ±5 knots, and touch down smoothly within the area specified by the examiner.

F. Wake Turbulence Avoidance

1. Description The applicant may be asked to explain how, where, and when wingtip vortices are generated, their characteristics and associated hazards, and recommended courses of action to remain clear of those hazards.

2. Acceptable Performance Guidelines The applicant shall identify the conditions and locations in which wingtip vortices may be encountered and adjust his flight path in a manner to avoid those areas. Failure to follow recommended procedures for minimizing the likelihood of flying into wingtip vortices shall be disqualifying.

IV. MAXIMUM PERFORMANCE MANEUVERS

Objective

To determine the applicant's competence in obtaining maximum airplane performance.

Procedures/Maneuvers

A. Short-Field Takeoff and Maximum Climb

1. Description The applicant may be asked to demonstrate a takeoff which is used at short fields with obstructions. He is expected to use prompt, smooth application of power and rotate to liftoff just as the best angle-of-climb airspeed is attained. He should maintain that speed until the assumed obstructions have been cleared. The applicant is expected to know and understand the effectiveness of the best rate-of-climb and best angle-of-climb airspeeds of the airplane to obtain maximum climb performance. The flap settings and airspeeds prescribed by the airplane manufacturer should be used.

2. Acceptable Performance Guidelines The applicant's competence shall be evaluated on the basis of his planning, smoothness, directional control, and accuracy. In simulating a short-field takeoff, the liftoft and climb shall be performed within ± 5 knots of the best angle-of-climb speed. The applicant shall obtain performance which is comparable to that presented in the airplane's perform-

ance data. Improper flap or propeller setting or premature retraction of the landing gear shall be disqualifying.

B. Short-Field Approach and Landing

1. Description The applicant may be asked to demonstrate a landing from over an assumed 50-ft. obstruction using a final approach speed which will result in little or no floating after the throttle is closed during the flare for touchdown. Touchdown should be made within the area designated by the examiner, at minimum controllable airspeed, in approximately the pitch attitude which results in a power-off stall. Upon touchdown, the applicant is expected to properly apply brakes to minimize the after-landing roll. Power, flaps, or moderate slips should be used as necessary on the last segment of the final approach.

2. Acceptable Performance Guidelines Performance shall be evaluated on the basis of planning, coordination, smoothness, and accuracy. The applicant shall accurately control the angle of descent and airspeed on final approach so that floating is minimized during the flare. After touchdown, he shall bring the airplane smoothly to a stop within the shortest possible distance consistent with safety. Improper or incomplete pre-landing procedures, touching down with an excessive side load on the landing gear, or poor directional control shall be disqualifying.

C. Soft-Field Takeoff

1. Description The applicant may be asked to demonstrate a soft-field takeoff. This should be accomplished with the wing at a relatively high angle of attack so as to transfer the weight from the wheels to the wing as soon as possible. The nosewheel or tailwheel should be lifted clear of the surface as soon as the elevators become effective. When lift-off occurs, the angle of attack should be reduced gradually with the wheels just clear of the surface until the best rate-of-climb airspeed is achieved. The flap setting used should be in accordance with the manufacturer's recommendations.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his planning, directional control, smoothness, and accuracy. The applicant shall lift off at not higher than the power-off stalling speed and maintain the best rate-of-climb speed. Improper flap or propeller setting or premature retraction of the landing gear shall be disqualifying.

D. Soft-Field Landing

1. Description The applicant may be asked to demonstrate a landing from a normal approach with touchdown at the slowest possible airspeed to permit the softest possible touchdown and a short landing roll. A nose-high attitude should be maintained during the roll-out and the flaps promptly retracted

(if recommended by the manufacturer) to prevent damage from mud or slush thrown by the wheels.

2. *Acceptable Performance Guidelines* The applicant's performance shall be evaluated on the basis of his planning, smoothness, and accuracy. He shall maintain final approach airspeed within ±5 knots of that prescribed. *During flap retraction the applicant shall exercise extreme caution and maintain positive control.* Improper or incomplete pre-landing procedures, touching down with an excessive side load on the landing gear, or poor directional control shall be disqualifying.

E. Chandelles

1. Description The applicant may be asked to perform chandelles both to the left and to the right. He should enter the maneuver at the maneuvering speed by establishing an appropriate angle of bank and pitch attitude which will produce a maximum climbing turn. A coordinated recovery should be started at 90° of turn and continued so that the 180° point is reached with the wings level and the airspeed just above a stall. The pitch attitude should then be lowered to the level flight attitude for the existing airspeed. The maneuver may be accomplished with the use of a fixed power setting or the coordinated use of power.

2. Acceptable Performance Guidelines Evaluation of performance shall be based on planning, airspeed control, coordination, smoothness, and orientation. The applicant shall complete the chandelles within $\pm 10°$ of the desired heading, and recover with an airspeed not more than 5 knots above stalling speed. A stall during the maneuver shall be disqualifying.

F. Lazy Eights

1. Description The applicant may be asked to perform a lazy eight. This consists of two 180° turns in opposite directions, with a symmetrical climb and dive performed during each turn. The airplane should be constantly rolled from one bank to the other, while the pitch attitude is constantly changed from climbs to dives. The loops should be symmetrical with portions above and below the horizon equal in size. At no time during the maneuver should the airplane attitude, control positions, or control forces be held constant.

2. Acceptable Performance Guidelines The applicant's performance shall be evaluated on the basis of his planning, coordination, smoothness, attitude, and airspeed control. A persistent gain or loss of altitude at the completion of each lazy eight, or repeated slipping or skidding, shall be disqualifying.

G. Steep Power Turns

1. Description The applicant may be asked to execute maximum performance turns in either direction using a bank of at least 50°, gradually imposing relatively high load factors well within the structural limits of the airplane. He should increase power as the bank is established and decrease power during the roll-out as required to maintain altitude and airspeed.

2. Acceptable Performance Guidelines The applicant's competence shall be evaluated on the basis of his planning, coordination, smoothness, prompt stabilization of the turns, and orientation during the maneuver. Variations of more than ±100 ft. from the entering altitude shall be disqualifying.

H. Descents

1. Description The applicant may be asked to establish the airplane configuration and glide speed which will result in the greatest forward distance with the least loss of altitude.

2. Acceptable Performance Guidelines The applicant shall promptly establish and maintain the proper configuration and pitch attitude which will produce the most efficient speed for glides.

I. Steep Spirals

1. Description The applicant may be asked to perform a steep spiral around a se-

lected ground reference point and continue for a minimum number of turns specified by the examiner. He should recover at a specified point relative to the ground reference. A constant radius around the point should be maintained by varying the bank to correct for wind effect.

2. *Acceptable Performance Guidelines* The applicant shall be competent in entering, maintaining, and recovering from steep spirals using smooth coordinated controls. Loss of orientation, descending below a safe altitude, or excessive variation of pitch attitude shall be disqualifying. Observance of the following limits will be accepted as competent performance:

a. Airspeed within ±10 knots of that recommended.

b. Steepest bank between 50° and 55°.

c. Recovery at the specified point or at a safe altitude.

d. Uniform radius around the reference point.

V. OPERATION OF AIRPLANE EQUIPMENT

Objective

To determine that the applicant has a thorough knowledge of, and can competently perform normal and emergency operations of all systems and equipment for the airplane used on the flight test.

Procedures/Maneuvers

A. Retractable Landing Gear Operation (Landplane or Amphibian)

1. Description The applicant may be asked to demonstrate the normal and emergency operation of the landing gear in accordance with the manufacturer's published recommendations.

2. Acceptable Performance Guidelines Performance shall be evaluated on the basis of the applicant's knowledge of normal and emergency procedures and the accuracy of his operations. Untimely operation of the landing gear which creates a hazard shall be disqualifying.

B. Flap Operation

1. Description The applicant may be asked to demonstrate the normal and emergency operation of flaps in accordance with the manufacturer's published recommendations. He should be knowledgeable regarding the effect of flaps on airplane performance.

2. Acceptable Performance Guidelines Performance shall be evaluated on the basis of the applicant's knowledge of normal and emergency procedures and the accuracy of his operations. Untimely operation of the flaps which creates a hazard shall be disqualifying.

C. Controllable Propeller

1. Description The applicant may be asked to demonstrate the operation of the propeller in accordance with the manufacturer's published recommendations. He should be knowledgeable regarding the effect of throttle and propeller settings on airplane performance.

2. Acceptable Performance Guidelines Performance shall be evaluated on the basis of the applicant's knowledge of operating procedures and the accuracy of his operation. Improper propeller settings which may damage the engine or create a hazard shall be disqualifying.

VI. EMERGENCY PROCEDURES

Objective

To determine that the applicant has a thorough knowledge of, and can competently perform emergency procedures for all systems and equipment installed in the airplane used on the flight test.

Procedures/Maneuvers

A. Power Loss

1. Description The applicant may be asked to demonstrate his knowledge of corrective actions for: (1) partial loss of power, (2) complete power failure, (3) rough engine, (4) carburetor ice, and (5) fuel starvation. The examiner will, with no advance

warning, reduce the power to simulate engine malfunction.

2. *Acceptable Performance Guidelines* The applicant shall be able to immediately recognize the loss of power and take prompt remedial action, and shall use good judgment and techniques to minimize the danger to occupants and the airplane. The applicant shall perform emergency procedures for loss of power in compliance with the manufacturer's published recommendations. Any action which creates an unnecessary hazard shall be disqualifying.

B. Equipment Malfunctions

1. Description The applicant may be asked to demonstrate his knowledge of corrective actions for (1) inoperative electrical system, (2) inoperative hydraulic system, (3) gear and flap malfunctions, (4) door opening in flight, and (5) inoperative elevator trim tab. He will be asked, where practicable, to actually perform the proper remedial action for such emergency conditions as flap malfunctions, landing gear malfunctions, or inoperative electrical or hydraulic system.

2. *Acceptable Performance Guidelines* Performance shall be evaluated on the applicant's prompt analysis of the situation and his performance of emergency procedures in conformance with the manufacturer's published recommendations. Any action which

creates unnecessary additional hazards shall be disqualifying.

C. Fire in Flight

1. Description The applicant is expected to recognize the symptoms of electrical fires and fuel fires. When the examiner describes the symptoms of a fire situation, the applicant is expected to follow emergency procedures appropriate for combating the type of fire.

2. Acceptable Performance Guidelines The applicant shall be able to recognize the type of fire described, determine its location, and explain the proper procedure for extinguishing the fire or for safely terminating the flight.

D. Collision Avoidance Precautions

1. Description The applicant is expected to exercise conscientious and continuous surveillance of the airspace in which the airplane is being operated to guard against potential mid-air collisions. In addition to "see and avoid" practices, he is expected to use VFR Advisory Service at nonradar facilities, Airport Advisory Service at nontower airports or FSS locations, and Radar Traffic Information Service where available.

2. Acceptable Performance Guidelines The applicant shall maintain continuous vigilance for other aircraft and take immediate actions necessary to avoid any

situation which could result in a mid-air collision. Extra precautions shall be taken, particularly in areas of congested traffic, to ensure that other aircraft are not obscured by his aircraft's structure. When traffic advisory service is used, the applicant shall understand terminology used by the radar controller in reporting positions of other aircraft. Failure to maintain proper surveillance shall be disqualifying.

E. Engine-Out Procedures (Multiengine Airplanes)

Engine-out procedures given in a multiengine airplane in conjunction with a commercial pilot flight test shall be conducted as specified in AC 61–57, "Multiengine Airplane Class and Type Rating Flight Test Guide."

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